

### **REMARKS**

In the office action dated June 24, 2008, the examiner rejected claim 14 under 35 U.S.C. 112, second paragraph, as being indefinite; claims 1-3, 5-8, and 10 under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 6,357,223 to Caren, et al.; and claims 1-14 under 35 U.S.C. 103(a) as being obvious over the Caren, et al. reference in view of admitted prior art on page 1 of the application.

Prior to the present amendment, claims 1-14 were pending. By this amendment, applicants have amended claims 1 and 14, and cancelled claims 5. Accordingly, claims 1-4 and 6-14 are under examination.

Support for the amendment to claims 1 and 14 can be found in the specification as filed at page 7, lines 6-23, claim 5 as originally filed, and page 4, lines 21-25. Accordingly, no new matter has been added by the amendments to the claims.

### **Declaration of Yves Creighton**

In the response below, statements regarding the technology of the present invention and cited reference are made. A declaration of co-inventor, Yves Creighton, under 37 C.F.R. 1.132 will be submitted shortly in order to verify the accuracy of these statements for the examiner.

### **35 U.S.C. 112 REJECTION**

Claim 14 was rejected under 35 U.S.C. 112, second paragraph, as being indefinite. According to the examiner, "it is unclear what part of the 'off-gas stream' is referred to by 'the gas stream', the same 'portion of the off-gas stream' of step (1) or what?".

Applicants have amended claim 14 to specify that the gas-stream in step (2) is from the plasma reactor. Accordingly, the 35 U.S.C. 112, second paragraph, rejection has been rendered moot.

### **35 U.S.C. 102(b) REJECTION**

Claims 1-3, 5-8, and 10 were rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 6,357,223 to Caren, et al. According to the examiner, Caren, et al. disclose a method and an apparatus for the reduction of the amount of pollutants, such as carbon monoxide, hydrocarbons, and oxides of nitrogen, in the exhaust gas stream produced by the high temperature combustion of fuel. The examiner alleges that the corona discharge disclosed by Caren, et al. is the same as the “plasma” claimed in the present invention, and that since the corona discharge device is mounted within the catalytic converter, the whole off-gas stream is being treated.

In the present response, applicants have amended claim 1 to add the feature “wherein said plasma has a frequency below 1 kHz.” Support for this amendment can be found in the specification as filed at page 7, lines 6-23 and claim 5 as originally filed.

Caren, et al. do not disclose a plasma that has a frequency below 1 kHz. In fact, Caren, et al. disclose a corona discharge device where “... about 20 to about 50 W of high frequency, high voltage power is required, *i.e.*, from about 1,000 to about 250,000 Hz...” See col. 16, lines 9-12 of Caren, et al. In other words, Caren, et al. disclose a plasma with a frequency of about 1 kHz to about 250 kHz.

According to MPEP §2132 and its citation of *Titanium Metals Corp. v. Banner*, anticipation of a range requires the exact disclosure of what is claimed. Since Caren, et al.’s disclosure of 1 kHz and the claimed “below 1 kHz” do not overlap, Caren, et al. do not anticipate the claimed range of below 1 kHz.

Applicants respectfully request that the rejection of claims 1-3, 5-8, and 10 under 35 U.S.C. 102(b) be reconsidered and withdrawn.

### **35 U.S.C. 103(a) REJECTION**

Claims 1-14 were rejected under 35 U.S.C. 103(a) as being obvious over Caren, et al. and further in view of the admitted prior art on page 1 of the specification. According to the examiner, Caren, et al. disclose a method and an apparatus for the reduction of the amount of

pollutants such as carbon monoxide, hydrocarbons, and oxides of nitrogen in the exhaust gas stream produced by the high temperature combustion of fuel. The examiner further relies upon page 1 of the specification for disclosing that it is known in the art that gas engines such as CHP generate an exhaust gas containing methane and NO<sub>x</sub> as contaminants that need to be removed. The examiner further maintains that it would have been obvious to one of ordinary skill in the art to optimize the electric field used to generate the corona discharge in the process of Caren, et al. in order to sufficiently produce the desired radicals, active or reactive species.

The main independent claims, *i.e.*, claims 1 and 14, have been amended to require the feature that “said plasma has a frequency below 1 kHz.” As discussed above, Caren, et al. disclose a plasma with a frequency of about 1 kHz to about 250 kHz. In particular, Caren, et al. require the use of high frequency, high voltage power.

According to the applicants, the high frequency, high voltage power ranges of Caren, et al. may be sufficient for the operation of an automotive catalytic converter but would be incapable of reducing the methane content in an off-gas stream of a gas-fired plant of the present invention. In particular, the plasma of the invention must be effective for use with off-gas produced by combustion of natural gas in a natural gas engine for combined heat and power generation. Creighton Declaration to be submitted.

Accordingly, the high frequency of the corona discharge required by Caren, et al. teach away from the lower frequencies required for reducing the methane content in an off-gas stream of a gas-fired plant.

Furthermore, applicants state that the use of low frequencies according to the claims allow for an effective *in situ* treatment of a gas stream in a natural gas engine for combined heat and power generation according to the method of the present invention, *e.g.* by using large electrode structures. Creighton Declaration to be submitted.

Accordingly, applicants respectfully request the withdrawal of the 35 U.S.C. 103(a) rejection.

Applicants respectfully submit that the application is now in proper form for allowance, which action is earnestly solicited. If resolution of any remaining issue is required prior to allowance of the application, it is respectfully requested that the examiner contact applicants' attorney at the telephone number provided below.

Respectfully submitted,

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